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10/690,556	10/23/2003	Moshe Hershkovich	2694/24	6413

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DR. MARK FRIEDMAN LTD.  
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Upper Marlboro, MD 20772

EXAMINER

FLEURANTIN, JEAN B

ART UNIT	PAPER NUMBER
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2162

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07/27/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/690,556	<b>Applicant(s)</b> HERSHKOVICH ET AL.	
	<b>Examiner</b> JEAN B. FLEURANTIN	<b>Art Unit</b> 2162	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 May 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6,8-38,40 and 41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6,8-11,13-22,24-28,30,31,33-38,40 and 41 is/are rejected.
- 7) ☒ Claim(s) 12,23,29 and 32 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

1. This is in response to the amendment filed on 05/14/2007.

The following is the status of claims:

Claims 7 and 39 have been canceled.

Claims 40 and 41 have been added. The limitations of claims 40 and 41 are discussed in the following rejection.

Claims 1-6, 8-38 and 40-41 remain pending for further examination.

Applicant's arguments submitted on 05/14/2007 have been fully considered but they are not persuasive because of specification objection(s) and new ground 35 U.S.C. 112 and 103 rejections of claims.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: "wherein a function for performing said pre-determined transformation is substantially independent of specific content of each said key entry of said key entries".

### ***Double Patenting***

A. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claim 1 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 2 of U.S. Patent No. 7,076,602. Although the conflicting claims are not identical, they are not patentably distinct from each other because it would have been obvious to the patent claim 31 to interchangeably "storing a plurality of key entries" to "performing a pre-determined transformation of each key entry of said plurality of key entries so as to obtain a plurality of coded entries" in order to provide an identification of whether a range boundary is closed or open; see Patent No. 7,076,602, col. 35, line 67 to col. 36, line 2).

Claim 31 of U.S. Patent No. 7,076,602 contain(s) every element of claim 1 of instant application serial No. 10/690,556 and thus anticipate the claim 1 of the instant application. Claim 1 of the instant application therefore are not patently distinct from the earlier patent claim 31 as such as are unpatentable over obvious-type double patenting. A later patent/application claim is not patentably distinct from an earlier claim if the later claim is anticipated by the earlier claim.

<p>Instant application 10/690,556</p> <p>A computer-implemented method of searching an ordered database using transformed key entries, the method comprising the steps of: (a) providing a system including:</p> <p>(i) a memory for storing a plurality of key entries, and</p> <p>(ii) processing logic for:</p> <p>(A) transforming <u>each key entry of</u> said key entries into a respective coded entry <del>coded entries</del>, and</p> <p>(B) searching said coded entries;</p> <p>b) performing a pre-determined transformation of each <u>said</u> key entry of <del>said plurality of key entries</del> <u>to produce said respective coded entry</u> so as to obtain a plurality of coded entries, and</p> <p>(c) performing a deterministic search in at least one the data structure within said memory to obtain a match between an input key and a key entry of said key entries, <del>Wherein said search is a pre-determined search,</del></p> <p>wherein a length, expressed as a number of bits, of said respective coded entry is reduced with respect to a length, expressed as a number of bits, of said key entry from which said respective coded entry was transformed, and wherein a function for performing said pre-determined transformation is substantially independent of specific content of each said key entry of said key entries.</p>	<p>US Pat. No. 7,076,602</p> <p>A method for processing data using an associative search engine having an external memory and for extracting the data from the external memory in response to an input key, the method comprising the steps of:</p> <p>(a) providing the associative search engine (ASE), the ASE having: (i) a search engine manager (SEM), disposed within a chip, said search engine manager including <u>processing logic</u>;</p> <p>(b) providing, for the ASE, an external memory system disposed outside of said chip, said external memory system including:</p> <p>(i) a plurality of memory storage units, each memory storage unit of said memory storage units having at least a first array for storing a plurality of key entries;</p> <p>(c) providing a memory for storing a plurality of associated data entries, said data entries being associated with said key entries;</p> <p>(d) providing an interface for data interfacing between said external memory system and said SEM; (e) arranging said key entries as logical two-dimensional arrays (TDAs) so as to increase a rate of data retrieval from said external memory system to said processing logic, and</p> <p>(f) searching said key entries, in response to the input key, so as to determine if the input key matches a particular key entry of said key entries.</p>
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***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6, 8-11, 13-16, 18-22, 24-28, 30-31, 33-38 and 40-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pub. No. 2002/0007446 issued to Stark ("Stark") in view of U.S. Patent No. 6,219,662 issued to Fuh et al., ("Fuh"), and further in view of U.S. Patent No. 5,933,104 issued to Kimura, Gary D. ("Kimura").

As per claim 1, Stark discloses "a computer-implemented method of searching" (see paragraph [0036]) "an ordered database" (i.e., an ordered set of storage (database); see paragraph [0054], line 1) the method comprising the steps of:

(a) providing a system (see Fig. 6 and paragraph [0252]) including:

"(i) a memory for storing a plurality of key entries" (i.e., an ordered set of memory cells for storing entries; see paragraph [0084], lines 1-2); and

(B) "searching said coded entries" (i.e., conducting a key (code) search; paragraph [0024], lines 1-3); and

"(c) performing a deterministic search in at least one data structure within said memory to obtain a match between an input key" (In light the specification at page 3, line 22 to page 4, line 5, the purpose of performing deterministic search is for obtaining a match between an input key and a key entry. The method for associating data values are extracted from memory upon conducting a key search on the associative key data is disclosed by Stark page 3, paragraph [0028]) and "a key entry of said key entries" (see paragraph [0258]).

Stark fails to explicitly disclose processing logic for using transformed key entries transforming said key entries into a respective coded entry ~~coded entries~~, and (b) performing a pre-determined

transformation of each said key entry of ~~said plurality of key entries~~ to produce said respective coded entry, so as to obtain a plurality of coded entries. However, Fuh discloses using transformed key entries transforming said key entries into a respective coded entry ~~coded entries~~, and (b) performing a pre-determined transformation of each said key entry of ~~said plurality of key entries~~ to produce said respective coded entry, so as to obtain a plurality of coded entries (see Fuh col. 2, lines 34-43 and col. 5, lines 40-60 and col. 6, lines 24-40). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method of Stark by processing logic for using transformed key entries transforming said key entries into a respective coded entry ~~coded entries~~, and (b) performing a pre-determined transformation of each said key entry of ~~said plurality of key entries~~ to produce said respective coded entry, so as to obtain a plurality of coded entries as disclosed by Fun (see Fun col. 6, lines 24-40 and Fig. 4). Such a modification would allow the method of Stark to provide data integrity (see Fun col. 36-40), therefore, improving the accuracy of the search method using coded keys.

While the combination of Stark/Fun substantially discloses the claimed invention, the combination fails to disclose in detail "a length, expressed as a number of bits, of said respective coded entry is reduced with respect to a length, expressed as a number of bits, of said key entry from which said respective coded entry was transformed, and wherein a function for performing said pre-determined transformation is substantially independent of specific content of each said key entry of said key entries." However, Kimura discloses wherein a length, expressed as a number of bits, of said respective coded entry is reduced with respect to a length, expressed as a number of bits, of said key entry from which said respective coded entry was transformed, and wherein a function for performing said pre-determined transformation is substantially independent of specific content of each said key entry of said key entries (see Kimura col. 5, line 66 to col. 6, line 30). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method of Stark/Fun by a length, expressed as a number of bits, of said respective coded entry is reduced with respect to a length, expressed as a number of bits, of said key entry from which said respective coded entry was transformed, and wherein a function for performing said pre-determined transformation is substantially independent of specific content of each said key entry of said key entries as disclosed by Kimura (see Kimura col. 7, lines 6, 2-7). Such a

modification would allow the method of Stark/Fuh to provide number of bits that are included in the offset field depends upon the location of the pattern of data in the sequence of data (see Kimura col. 3, lines 9-11).

As per claim 2, Stark discloses "said search is deterministic with respect to specific key data" (i.e., conducting a key search on the associative key data; see paragraph [0028]).

As per claim 3, Stark discloses "said specific key data includes said input key" (i.e., an ordered set of k-bit inputs; see paragraph [0090]).

As per claim 4, Stark discloses "said specific key data includes said key entries" (i.e., a k-bit key input for inputting; see paragraph [0088]).

As per claim 5, Stark discloses "said specific key data includes said coded entries in said data structure" (i.e., the entry comprises a k-bit value; see paragraph [0084]).

As per claim 6, in addition to claim 1, Stark discloses "said search is deterministic with respect to a required amount of auxiliary data" (see paragraph [0059]).

As per claim 8, Stark discloses, in addition to claim 1, "includes information relating to at least one different key entry of said key entries" (see paragraph [0273]).

As per claim 9, Stark discloses "said at least one different key entry is a single key entry" (i.e., receiving an input key; see paragraph [0028]).



As per claim 10, Stark discloses "said information includes positional information" (i.e., position of the boundary values (information); see paragraph [0207]).

As per claim 11, Stark discloses "said information includes information resulting from at least one varying bit" (i.e., boundary type of information, representing by a bit; see paragraph [0051]).

As per claim 13, the limitations of claim 13 are similar to claims 1 and 17, therefore, the limitations of claim 13 are rejected in the analysis of claims 1 and 17, and this claim is rejected on that basis.

As per claim 14, Stark discloses "said performing of said deterministic search includes: (i) processing said coded keys to determine a required set of auxiliary data, said set being required to proceed with said search" (i.e., conducting a key (code) search; paragraph [0024], lines 1-3), and

"(ii) using said required set of auxiliary data for an additional processing of said coded keys so as to determine a result of said search" (i.e., associated data values are extracted from memory upon conducting a key search on the associative key data; see page 3, paragraph [0028]).

As per claim 15, Stark discloses "said auxiliary data includes a portion of a key entry" (see paragraph [0062]), and "wherein said portion is then compared to said input key" (see paragraph [0070]).

As per claims 17, 19 and 27, While the combination of Stark/Fuh substantially discloses the claimed invention, the combination fails to disclose in detail "for said key entries of any finite length, said length of each said respective coded entry, after performing said transformation, is up to a closest integer larger than log base 2 of said length of said key entry from which said respective coded entry was transformed." However, Kimura discloses for said key entries of any finite length, said length of each said respective coded entry, after performing said transformation, is up to a closest integer larger than log base 2 of said length of said key entry from which said respective coded entry was transformed (see Kimura col. 7, lines 31-45). It would have been obvious to a person of ordinary skill in the art at the time

the invention was made to modify the method of Stark/Fuh by for said key entries of any finite length, said length of each said respective coded entry, after performing said transformation, is up to a closest integer larger than log base 2 of said length of said key entry from which said respective coded entry was transformed as disclosed by Kimura (see Kimura col. 7, lines 11-30). Such a modification would allow the method of Stark/Fuh to provide number of bits that are included in the offset field depends upon the location of the pattern of data in the sequence of data (see Kimura col. 3, lines 9-11).

As per claim 16, Stark discloses "said search is an exact search, and wherein said performing of said deterministic search includes: (i) processing said coded keys to determine a required set of auxiliary data, said set being required to proceed with said search" (i.e., conducting a key (code) search; paragraph [0024], lines 1-3), and

"(ii) comparing said set with said input key to determine a result of said search" (i.e., associating (comparing) data values are extracted from memory upon conducting a key search on the associative key data; see page 3, paragraph [0028]).

As per claim 18, the limitations of claim 18 are similar to claims 1 and 17, therefore, the limitations of claim 18 are rejected in the analysis of claims 1 and 17, and this claim is rejected on that basis.

As per claim 20, the limitations of claim 20 are similar to claim 1, therefore, the limitations of claim 20 are rejected in the analysis of claim 1, and this claim is rejected on that basis.

As per claim 21, in addition to claim 1, Stark further discloses "(d) so as to obtain a match between an input key and a key entry of said key entries" (i.e., input key is contained in one or more associative elements, in which the associated data that corresponds to the associative element that contains the input key; see paragraph [0024]).

Stark fails to explicitly disclose performing a deterministic search within said at least one node of said search-tree structure. However, Fuh discloses performing a deterministic search within said at least

one node of said search-tree structure (In light the specification at page 27, lines 1-21, the purposed of searching a B-tree is for performing a deterministic search within said at least one node of said search-tree structure; see Fuh col. 5, lines 50-52 and Fig. 4, items 414 and 416). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method of Stark by performing a deterministic search within said at least one node of said search-tree structure as disclosed by Fuh (see Fig. 4, items 414 and 416). Such a modification would allow the method of Stark to provide data integrity (see Fuh col. 36-40), therefore, improving the accuracy of the search method using coded keys.

As per claim 22, in addition to claim 1, Stark further discloses "relating to at least one different key entry of said key entries" (see paragraph [0273]).

As per claim 24, in addition to claim 1, Stark further discloses "includes positional information" (i.e., position of the boundary values (information) on the integer number axis; see paragraph [0207]) "relating to a different respective key entry" (see paragraphs [0092 - 0093]).

As per claim 25, the limitations of claim 25 are similar to claim 1, therefore, the limitations are rejected in the analysis of claim 1, and this claim is rejected on that basis.

As per claim 26, the limitations of claim 26 are similar to claim 1, therefore, the limitations are rejected in the analysis of claim 1, and this claim is rejected on that basis.

As per claim 27, the limitations of claim 27 are similar to claim 1, therefore, the limitations are rejected in the analysis of claim 1, and this claim is rejected on that basis.

As per claim 28, Stark discloses "said auxiliary data includes at least a portion of a key entry of said key entries" (see paragraph [0258]).

As per claim 30, Stark discloses "said auxiliary data is a portion of a single key entry" (see paragraph [0093]).

As per claim 31, in addition to claims 1 and 21, Stark further discloses "includes information resulting from at least one varying bit" (see paragraph [0093]).

As per claim 33, Stark discloses "said search is deterministic with respect to specific key data" (i.e., conducting a key search on the associative key data; see paragraph [0028]).

As per claim 34, Stark discloses "said specific key data includes said input key" (i.e., an ordered set of k-bit inputs; see paragraph [0090]).

As per claim 35, Stark discloses "said specific key data includes said key entries" (i.e., a k-bit key input for inputting; see paragraph [0088]).

As per claim 36, Stark discloses "said specific key data includes said coded entries in said data structure" (see paragraph [0084]).

As per claim 37, Stark discloses "said search is deterministic (see paragraph [0028]) with respect to a required amount of auxiliary data" (see paragraph [0059]).

As per claim 38, Stark discloses "said search is a pre-determined search" (i.e., conducting a search; see paragraph [0024]).

As per claims 40 and 41, the limitations of claims 40 and 41 are similar to claims 1-4, therefore, the limitations of claims 40-41 are rejected in the analysis of claims 1-4, and these claims are rejected on that basis.

*Claim Objections/Allowable Subject Matter*

Claims 12, 23, 29 and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

*Prior Art*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Stojancie, M. M., US Pat. No. 7,219,184 relates to storing and retrieving data in computer memory where a longest prefix key is matched; see col. 1, lines 19-21.

Further, see col. 9, 29-45 and col. 13, lines 30-46.

*Response to Arguments/Remarks*

Applicant's arguments filed 2/14/2007 with respect to the pending claims have been fully considered but they are not persuasive. Because, the prior art of record discloses the claimed invention.

Therefore, the claims are rejected under 35 U.S.C. 112, 103 and the nonstatutory double patenting rejection.

The rejection(s) of claims under 35 U.S.C. 101 has been withdrawn.

### CONTACT INFORMATION

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEAN B. FLEURANTIN whose telephone number is 571 – 272-4035. The examiner can normally be reached on 7:05 to 4:35.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOHN E BREENE can be reached on 571 – 272-4107. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jean Bolte Fleurantin

Patent Examiner

Technology Center 2100

July 23, 2007